**WHAT IS CLAIMED IS:**

1. A monitoring system, comprising:

a first chemical vessel containing a first chemical mixture;

a second chemical vessel containing a second chemical mixture; and

a sensor configured to selectively receive a first sample flow of said first chemical mixture from said first chemical vessel and to selectively receive a second sample flow of said second chemical mixture from said second chemical vessel, wherein said sensor is configured to measure a first sample attribute of said first sample flow and a second sample attribute of said second sample flow.

2. The monitoring system of claim 1, wherein said sensor is a concentration sensor configured to measure concentration, and wherein said first sample attribute is a first sample concentration of a first chemical within said first sample flow, and wherein said second sample attribute is a second sample concentration of said first chemical within said second sample flow.

3. The monitoring system of claim 2, wherein said first sample flow comprises a liquid, and wherein said second sample flow comprises a liquid.

4. The monitoring system of claim 1, further comprising a supply distribution system configured to selectively transport said first sample flow and said second sample flow to said sensor.

5. The monitoring system of claim 4, wherein said supply distribution system is configured to transport said first sample flow and said second sample flow to said sensor at a substantially constant flow rate during operation.

6. The monitoring system of claim 4, further comprising:

a purge fluid supply, wherein said supply distribution system is further configured to selectively transport a purge fluid flow from said purge fluid supply to said sensor;

a drain configured to receive fluids; and

a return distribution system, wherein said return distribution system is configured to transport purge fluids from said sensor to said drain, and wherein said return distribution system is configured to selectively transport said first sample flow from said sensor to said first chemical vessel or to said drain, and wherein said return distribution system is configured to selectively transport said second sample flow from said sensor to said second chemical vessel or to said drain.

7. The monitoring system of claim 1, wherein said sensor is configured to measure a first sample attribute value for said first sample attribute and a second sample attribute value for said second sample attribute, and further comprising a control system configured to receive said first sample attribute value and said second sample attribute value from said sensor, and wherein said control system comprises a display unit configured to display said first sample attribute value and said second sample attribute value.

8. The monitoring system of claim 7, wherein said sensor is configured to measure a plurality of first sample attribute values for said first sample flow, and wherein said control system is configured to receive said plurality of first sample attribute values from said sensor and to filter said plurality of first sample attribute signals to produce a filtered first sample attribute value, and wherein said control system is configured to display said filtered first sample attribute value on said display unit, and wherein said sensor is configured to measure a plurality of second sample attribute values for said second sample flow, and wherein said control system is configured to receive said plurality of second sample attribute values from said sensor and to

filter said plurality of second sample attribute values to produce a filtered second sample attribute value, and wherein said control system is configured to display said filtered second sample attribute value on said display unit.

9. The monitoring system of claim 7, wherein said control system is configured to determine whether said first sample attribute value is outside of a first sample attribute value range bounded by a low first sample attribute value and a high first sample attribute value, and wherein said control system is configured to generate an out-of-tolerance signal upon determining that said first sample attribute value is outside of said first sample attribute value range.

10. The monitoring system of claim 9, wherein said first sample attribute value range is a primary first sample attribute value range and said low first sample attribute value is a primary low first attribute value, and wherein said high first sample attribute value is a primary high first sample attribute value, and wherein said control system is further configured to determine whether said first sample attribute value is outside of a secondary first sample attribute value range bounded by a secondary low first sample attribute value and a secondary high first sample attribute value, said secondary first sample attribute value range being larger than said primary first sample attribute value range, and further comprising a processing tool configured to use said first chemical mixture in processing a semiconductor substrate, and wherein upon a determination that said first sample attribute value is outside of a secondary first sample attribute value range, said control system is configured to transmit an inhibit signal to said processing tool for said first chemical vessel, and wherein said processing tool is configured to refrain from using said first chemical mixture in processing upon receipt of said inhibit signal for said first chemical vessel.

11. The monitoring system of claim 1, wherein said first chemical mixture comprises a first bulk attribute value, and further comprising a control system configured to receive said first sample attribute value and said second sample attribute value from said sensor, wherein said control system is configured to input said first sample attribute value into a first attribute control

algorithm to calculate a first attribute control output, and wherein said control system is further configured to direct the adjusting of said first bulk attribute value according to said first attribute control output.

12. The monitoring system of claim 11, wherein said control system is configured to determine a first attribute error value from said first sample attribute value and a first attribute setpoint value, and wherein said first attribute control output comprises a first attribute control response time based on said first sample attribute value, and wherein if said first attribute error value is less than a first attribute dead band value, said control system is configured to set said first attribute control response time to zero, and wherein if said first attribute error value is greater than a first attribute dead band value, said control system is configured to calculate said first attribute control response time from said first attribute error value.

13. The monitoring system of claim 11, wherein said first bulk attribute value is a concentration of a first chemical within said first chemical mixture, and further comprising a first chemical supply configured to be in fluid communication with said first chemical vessel, and wherein said control system is configured to direct the transporting of a first chemical supply flow from said first chemical supply to said first chemical vessel to increase said first chemical concentration within said first chemical mixture.

14. The monitoring system of claim 13, wherein said first chemical mixture further comprise a second chemical having a second chemical concentration within said first chemical mixture, and further comprising a second chemical supply configured to be in fluid communication with said first chemical vessel, and wherein said control system is configured to direct the transporting of a second chemical supply flow from said second chemical supply to said first chemical vessel to decrease said first chemical concentration within said first chemical mixture.

15. The monitoring system of claim 13, wherein said second chemical mixture comprises a first chemical having a first chemical concentration within said second mixture, and wherein said first chemical supply is configured to be in fluid communication with said second chemical

vessel, and wherein said control system is configured to direct the transporting of a first chemical supply flow from said first chemical supply to said second chemical vessel to increase said first chemical concentration within said second chemical mixture.

16. A monitoring process, comprising:

providing a sensor configured to measure an attribute of a chemical mixture, a first chemical vessel containing a first chemical mixture, and a second chemical vessel containing a second chemical mixture;

performing a monitoring sequence on an nth sample attribute of an nth sample flow of the nth chemical mixture, wherein nth is an ordinal number, and wherein said performing a monitoring sequence comprises performing the monitoring sequence for nth = "first", said performing a monitoring sequence further comprising:

performing a measurement sequence, said performing a measurement sequence comprising:

transporting the nth sample flow of the nth chemical mixture from the nth chemical vessel to the sensor; and

measuring an nth sample attribute of the nth sample flow with the sensor for producing an nth sample attribute value; and

repeating said performing a monitoring sequence on an nth sample attribute for nth = "second".

17. The process of claim 16, wherein the sensor is a concentration sensor, and wherein said measuring an nth sample attribute of the nth sample flow comprises measuring a nth sample concentration of a first chemical in the nth sample flow.

18. The process of claim 17, wherein the nth sample flow comprises a liquid.

19. The process of claim 16, wherein said transporting the nth sample flow of the nth chemical mixture from the nth chemical vessel to the sensor comprises transporting the nth sample flow to the sensor at a substantially constant flow rate during said measuring an nth sample attribute.

20. The process of claim 16, wherein the nth chemical mixture comprises an nth bulk attribute having an nth bulk attribute value, and wherein measuring an nth sample attribute value comprises measuring an nth sample attribute value that is representative of the nth bulk attribute value at the time the nth sample attribute value is measured.

21. The process of claim 16, wherein said providing further comprises providing a control system configured to receive measured attribute values from the sensor, wherein the control system comprises a display unit, and wherein said performing a measurement sequence further comprises:

transmitting the nth sample attribute value to the control system; and

displaying the nth sample attribute value on the display unit.

22. The process of claim 21, further comprising performing a dump flow sequence, wherein said performing a dump flow sequence comprises:

transporting an nth sample flow of the nth chemical mixture from the nth chemical vessel to a sensor;

suppressing the display of measured attribute values of the nth sample flow; and

transporting the nth sample flow from the sensor to a drain.

23. The process of claim 16, wherein said providing further comprises providing a processing tool configured to use the first and second chemical mixtures within the first and second chemical vessels in processing, the process further comprising:

determining whether the sensor is ready to measure, wherein said determining whether the sensor is ready to measure is performed prior to said monitoring; and

performing an equipment verification sequence, said performing an equipment verification sequence comprising:

determining whether the processing tool is ready for processing; and

determining whether the nth chemical vessel is ready for processing.

24. The monitoring process of claim 16, wherein said performing a monitoring sequence further comprises performing a control sequence subsequent to said performing a measurement sequence, said performing a control sequence comprising:

inputting the nth sample attribute value into an nth attribute control algorithm for calculating an nth attribute control output; and

adjusting an nth bulk attribute value of the nth chemical mixture according to the nth attribute control output.

25. The monitoring process of claim 24, wherein said calculating an nth attribute control output comprises determining an nth attribute error value from the nth sample attribute value and an nth attribute setpoint value, and wherein the nth attribute control output comprises an nth attribute control response time and further comprising calculating the nth attribute control

response time based on the nth attribute error value, and wherein if the nth attribute error value is less than an nth attribute dead band value, said calculating the nth attribute control response time further comprises setting the nth attribute control response time to zero, and wherein if the nth attribute error value is greater than an nth attribute dead band value and positive, said calculating the nth attribute control response time further comprises multiplying the nth attribute error and an nth attribute control constant for producing the nth attribute control response time, and wherein said adjusting an nth bulk attribute comprises increasing the nth bulk attribute.

26. The monitoring process of claim 25, wherein the nth bulk attribute is a concentration of a first chemical, and further comprising providing a first chemical supply of the first chemical, wherein said adjusting the nth bulk attribute value comprises performing a first chemical supply sequence, said performing a first chemical supply sequence comprising transporting a first chemical supply flow of the first chemical from the first chemical supply to the nth chemical vessel.

27. A control system configured to communicate with a sensor configured to measure a sample attribute of a sample flow, the control system comprising a storage element, said storage element having several groupings of instructions for carrying out several processing steps, the processing steps comprising:

executing a monitoring process on an nth chemical mixture contained in an nth chemical vessel, wherein nth is an ordinal number, and wherein said executing a monitoring process comprises executing the monitoring process for nth = "first", said executing a monitoring process further comprising:

executing a measurement process on the nth chemical mixture, said executing a measurement process comprising:

directing the transporting of an nth sample flow of the nth chemical mixture from the nth chemical vessel to the sensor; and

receiving a nth sample attribute value of the nth sample flow measured by the sensor; and

repeating said executing a monitoring process for nth = "second".

28. The processing steps of claim 27, wherein receiving an nth sample attribute value comprises receiving an nth sample concentration of a first chemical within the nth sample flow measured by the sensor.

29. The processing steps of claim 27, wherein said directing the transporting of the nth sample flow of the nth chemical mixture from the nth chemical vessel to the sensor comprises directing the transporting of the nth sample flow to the sensor at a substantially constant flow rate during operation.

30. The processing steps of claim 27, wherein said executing a measurement sequence further comprises directing the displaying of the nth sample attribute value on a display unit.

31. The processing steps of claim 30, wherein receiving a nth sample attribute value measured by the sensor from the sensor further comprises receiving a plurality of nth sample attribute values measured by the sensor from the sensor, and wherein said directing the displaying of the plurality of nth sample attribute values on a display unit further comprises:

filtering the plurality of nth sample attribute values with the control system for producing a filtered nth sample attribute value; and

transmitting the filtered nth attribute value to the display unit.

32. The processing steps of claim 31, wherein said filtering the plurality of nth sample attribute values further comprises:

excluding the first numJunk nth sample attribute values of the plurality of nth sample attribute values from the calculation of the filtered nth sample attribute value; and

calculating the filtered nth sample attribute value from the next numMeas nth sample attribute values of the plurality of nth sample attribute values.

33. The processing steps of claim 27, wherein said executing a measurement process further comprises:

determining whether the nth sample attribute value is outside of an nth sample attribute range bounded by a low nth sample attribute value and a high nth sample attribute value;

generating an out-of-tolerance signal upon a determination that the nth sample attribute value is outside of the nth sample attribute value range.

34. The processing steps of claim 33, wherein the nth sample attribute value range is a primary nth sample attribute value range, and wherein the low nth sample attribute value is a primary low sample attribute value, and wherein the high nth sample attribute value is a primary high nth sample attribute value, and wherein determining whether the nth sample attribute value is outside of an nth sample attribute range further comprises determining whether the nth sample attribute value is outside of a secondary nth sample attribute value range bounded by a secondary low nth sample attribute value and a secondary high nth sample attribute value.

35. The processing steps of claim 34, wherein said executing a measurement process further comprises upon determining that the nth sample attribute value is outside of the secondary sample attribute value range, generating an inhibit signal configured to prevent the nth chemical mixture within the nth chemical vessel from being used in processing.

36. The processing steps of claim 33, wherein a length of time between instances of said repeating said executing a monitoring process is a total cycle time, wherein upon determining that a nth sample attribute value is outside of a nth sample attribute range, further comprising increasing a portion of the total cycle time occupied by said executing a measurement process.

37. The processing steps of claim 27, wherein said executing a monitoring process further comprises executing a dump flow process for the nth chemical mixture prior to said executing a measurement process, said executing a dump flow process comprising:

directing the transporting of an nth sample flow of the nth chemical mixture from the nth chemical vessel to a sensor;

suppressing the display of measured attribute values of the nth sample flow; and

directing the transporting of the nth sample flow from the sensor to the drain.

38. The processing steps of claim 27, wherein said executing a monitoring process further comprises:

determining whether a sensor is ready to measure;

executing a equipment readiness verification process for the nth chemical mixture, said executing a equipment readiness verification process comprising:

determining whether a processing tool configured to use the nth chemical mixture from a nth chemical vessel is ready for processing; and

determining whether the nth chemical vessel containing the nth chemical mixture is ready for processing.

39. The processing steps of claim 27, wherein said executing a monitoring process further comprises executing a control process subsequent to said executing a measurement process, said executing a control process comprising:

inputting the nth sample attribute value into an nth attribute control algorithm for calculating an nth attribute control output;

directing the adjusting of a nth bulk attribute value of the nth chemical mixture according to the nth attribute control output.

40. The processing steps of claim 39, wherein receiving a nth sample attribute value measured by the sensor from the sensor further comprises receiving a plurality of nth sample attribute values measured by the sensor from the sensor, and wherein said executing a measurement sequence further comprises filtering the plurality of nth sample attribute values for producing a filtered nth sample attribute value, and wherein said inputting the nth sample attribute value into an nth attribute control algorithm comprises inputting the filtered nth attribute value into the nth attribute control algorithm.

41. The processing steps of claim 39, wherein the nth sample attribute value is greater than an nth attribute setpoint, and wherein said adjusting an nth bulk attribute value comprises decreasing the nth bulk attribute value.

42. The processing steps of claim 39, wherein the nth sample attribute value is less than an nth attribute setpoint, and wherein said adjusting an nth bulk attribute value comprises increasing the nth bulk attribute value.

43. The processing steps of claim 42, wherein said calculating an nth attribute control output comprises determining an nth attribute error value from the nth sample attribute value and an nth attribute setpoint value, and wherein the nth attribute control output comprises an nth attribute control response time and further comprising calculating the nth attribute control response time

based on the nth attribute error value, and wherein if the nth attribute error value is less than an nth attribute dead band value, said calculating the nth attribute control response time further comprises setting the nth attribute control response time to zero, and wherein if the nth attribute error value is greater than an nth attribute dead band value and positive, said calculating the nth attribute control response time further comprises calculating the nth attribute control response time from the nth attribute error value and an nth attribute control constant.

44. The processing steps of claim 43, wherein the nth bulk attribute is a bulk concentration of a first chemical within the first chemical mixture, wherein said adjusting the nth bulk attribute value comprises executing a first chemical supply process, said executing a first chemical supply process comprising directing the transporting of a first chemical supply flow of the first chemical from a first chemical supply to the nth chemical vessel.

45. The processing steps of claim 44, wherein said directing the transporting of a first chemical supply flow comprises directing the transporting of the first chemical supply flow to the nth chemical vessel for the nth attribute control response time, and wherein said executing a first chemical supply process further comprises:

directing the transporting of a first chemical supply flow to a drain for an nth attribute pre-control response time;

directing the transporting of the nth sample flow from the nth chemical vessel to the sensor; and

directing the transporting of the nth sample flow from the sensor to the nth chemical vessel during said transporting the first chemical supply flow to the nth chemical vessel for the nth attribute control response time.